



Stakeholders perception of attitudes towards major landscape changes held by the public: The case of greenhouse clusters in Flanders

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ABSTRACT

The intensification of greenhouse horticulture is a notable trend in many regions around the world. This intensification causes the grouping of large-scale greenhouses on a single site, into so-called 'greenhouse clusters'. The main incentive for clustering is the reduction of production costs by sharing infrastructure such as energy, water and gas facilities. Despite these advantages, the public remains sceptic towards greenhouse clusters and resistance in Flanders is frequent and often fierce. The objective of this research is to obtain insight into the reasons, underlying motives and processes that steer this resistance as they are perceived by the agricultural sector. A grounded theory approach resulted in a comprehensive scheme that visualizes the public resistance towards greenhouse clusters as perceived by stakeholders in the agricultural sector, and as such the scheme includes factors that are probably also seen as key factors for the resistance among the stakeholders. Our research shows that the protest actions are complex and cannot be attributed to a single concept such as the NIMBY-concept that is still often put forward by politicians, planners and investors.

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Introduction

Structural adjustments of the agricultural sector have led to dramatic changes in the composition of the farming sector throughout Western Europe (Kristensen, 1999). Also in Flanders the number of farms declined while the average farm size increased (Calus et al., 2008). In recent years the greenhouse sector in particular has been confronted with this increase in scale. In the Netherlands, Spain and Canada commercial greenhouses have an average size of 3 ha and may stretch over 30 ha in a single development (Agüera and Liu, 2009; CBS, 2010; Statcan, 2010). Knowing that the current average size of a greenhouse holding in Flanders is 0.6 ha (NIS, 2005) we can get the grasp of such an evolution. If the Flemish horticulture sector wants to maintain or even strengthen its position on (inter)national markets, an increase in scale and a modernisation of the existing greenhouses are indispensable. In order to tackle this problem, the Flemish Agricultural Department set the goal of a renewal of about 100 ha of greenhouses per year (which means 5% of the total greenhouse area) (Leterme, 2007; Ministerie van de Vlaamse Gemeenschap, 2003). However, the authorities responsible

for spatial planning are, under pressure of the public opinion, very reluctant to give the necessary permits to build such large structures. A policy document concerning the spatial planning of greenhouse horticulture in Flanders was written to deal with this problem (Ministerie van de Vlaamse Gemeenschap, 2003). In this document, several tracks are proposed to achieve the goal of renewing 5% greenhouses per year. One of these tracks is the development of 'industrial estates' or 'business parks', specifically destined for greenhouse horticulture. Such 'greenhouse clusters' would offer several benefits: multiple horticultural companies can group and share the required infrastructure (such as energy, water and gas facilities), allowing for cheaper production and less environmental damage; heavy traffic can be guided in such a way that it causes less trouble for the neighbourhood; and integration of the greenhouse park in the surrounding landscape can be established more professionally than when individual horticulturists are left to their own devices. In highly urbanised regions (such as Flanders) there is the additional advantage that more space can be safeguarded for other purposes (Rogge et al., 2008).

Despite these advantages the public attitude towards greenhouse clusters in Flanders does not seem to be very positive. Resistance against the construction of new, large-scale greenhouses has increased, with more and heavier protest actions occurring over the last couple of years (Fig. 1). Public meetings are prompted, demonstrations are organised, objections are formulated and petitions are signed, all of this resulting in a strenuous

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Fig. 1. Signpost with slogans against the development of large-scale greenhouses. These signs can be found frequently in Northern region of the province of Antwerp.

and prolonged procedure to obtain building permits for a single development. To develop a greenhouse 'cluster' the situation is even more difficult. After 10 years of debate and planning, thus far not a single cluster has been realised or even approved.

Resistance to major landscape change

Studies in the field of landscape aesthetics have shown that residents and visitors frequently reject planned changes of the existing landscape (Sell and Zube, 1986; Staats, 1990; Willis and Garrod, 1992). van den Berg and Vlek (1998) state that the evaluations of planned changes at the very least reflect a 'resistance to change' in general, rather than a resistance to the specific contents of the planned change.

Several authors have tried to explain people's resistance to change by pointing out that change implies perception of risk and people have a general aversion towards risk (Willis and Garrod, 1992; Schwartz, 1994). Importantly, risk aversion is a function of people's reference point at the time of choice (Kahneman and Tversky, 1979). Risk aversion is strongest when the status quo is viewed as a gain situation. Applied to landscapes, planned-change contexts may transform the landscape into a risky alternative to the status quo, that might lead to a less favourable landscape (van den Berg and Vlek, 1998). This effect may be particularly strong for rural landscapes as the status quo situation is often associated with values such as biodiversity, tranquillity and a traditional way of life (Strumse, 1996). van den Berg and Vlek (1998) suggest that the resistance against change may be intensified by factors that increase the perceived threat posed by the planned changes. Planned changes may be perceived as more threatening if people are personally affected by the consequences of the planned change of a landscape, for example because their daily life takes place in this very landscape. Another important determinant of perceived threat may be the degree of similarity between the status quo and planned change. Plans that are more dissimilar to the status quo present a greater threat and will therefore most probably evoke more resistance (Willis and Garrod, 1992). As the construction of a greenhouse cluster in a rural area generally presents a very dissimilar situation from the status quo a lot of resistance can be expected.

Another argument that is often put forward when trying to explain the opposition against major landscape changes is the NIMBY-syndrome. Wolsink (2007) describes NIMBY as the fact that people have positive attitudes towards something until they are actually confronted with it, and that they then oppose it for selfish

reasons. Although literature makes us realize that the NIMBY-concept is not the correct theory to explain the opposition against major landscape changes (Wolsink, 2007; van der Horst, 2007; Mannarini et al., 2009; Warren and McFayden, 2010) it still has enormous popularity among planners, policy makers and investors who prefer it as their scapegoat for oppositional behaviour against concrete projects (Wolsink, 2007). Because of this popularity and the fact that the NIMBY argument is frequently used in the case of greenhouse clusters, we take a look at how the NIMBY idea is being used and elaborated in the context of comparable landscape changes.

Public attitude towards comparable landscape changes (wind energy projects)

In our search for comparable landscape changes we found little evidence of changes that evoke such a controversy as the construction of large-scale greenhouses. Although in the media we found cases of local protest actions against the construction of manure processing installations or biogas plants, this resistance is not systematic and widespread. A comparable development with which rural areas have been confronted in recent years however, is the construction of wind farms.

Public attitudes anywhere in Europe show moderate to strong support for the implementation of renewable energy. Nevertheless, planning wind power developments appears to be a complicated matter in most countries (Wolsink, 2007) and in some cases the construction of wind farms also provokes considerable controversy (Woods, 2003). Visual evaluation of the impact of wind power on the values of the landscape is one of the factors explaining why some are opposed to wind power implementation and why others support it (Wolsink, 2007). The case of protest against wind energy is however quite complicated to unravel. Besides visual arguments there are also more complicated issues at play related to livelihood, values and justice (Gross, 2007). This confirms that NIMBY is a far too simple concept to explain protest against wind farm developments or other unwanted land uses. In recent years several theories have been put forward to explain these protest movements.

Mannarini et al. (2009) use Klandermans' model on participation that uses three key elements (collective identity, sense of injustice and collective efficacy) to explain local collective action and protest against so-called LULU's (locally unwanted land uses). Mannarini et al. (2009) found that these three elements indeed play a role in the mobilization of people against locally unwanted land uses. On the other hand she also found three additional elements that can account for this mobilization namely; social embeddedness, social pressure exerted by the majority and place attachment.

van der Horst and Toke (2010) studied the relevance of concepts such as environmental equity and social capital in the light of planning wind farm developments in rural England. The question of environmental justice arises when there is evidence of inequality in terms of exposure to negative environmental impacts. They found that new wind farms are significantly more likely to receive planning permission, and thus being built, in relatively more vulnerable and deprived local areas. On the other hand in areas populated by more politically active, older, private-sector oriented people there will be greater resources available to fight appeals by developers. The availability of social and financial capital is therefore an important factor in conflicts concerning a wind farm siting (van der Horst and Toke, 2010).

Warren and McFayden (2010) studied whether actively involving the stakeholders through a system of community ownership can alter public attitudes and downplay protest against wind farm developments. Their study indeed suggests that the public support for wind farms in Scotland and the UK could be increased by chang-

ing the development model as ownership has been found to have a positive influence on the attitudes of stakeholders towards wind energy projects.

Wolsink (2007) and Gross (2007) explore the validity of fairness and justice instead of backyard motives when trying to explain the public attitude toward wind farm developments. The concepts of fairness and justice can be used interchangeably and in their most simple meaning refer to “rightfulness; that what is deserved” (Macquarie, 1996). Many types of justice have been proposed, Gross (2007) discusses two major types. *Distributive justice* focuses on the equitable distribution of outcomes, which can either be public goods or public ‘burdens’. In contrast *procedural justice* is concerned with the process by which decisions are made. Important elements in procedural justice include rights of participation, access to information, and lack of bias on the part of the decision maker (Gross, 2007). Wolsink (2007) found that local protest against wind farm developments is not founded in the egotist NIMBYism but is rather caused by a perceived injustice. The perception of fairness in decision making about siting facilities such as wind farms, are strongly connected with perceived environmental risks, and also with strongly deviating core values about how society should take decisions, not only within the public, but among all stakeholders involved in such processes.

The afore mentioned authors have tried to understand and explain reasons for local protest against wind farm developments, but they indicate that their theoretical frameworks can also be used for comparable developments in rural areas. We therefore keep these theoretical concepts in mind when analysing the data of our own research.

The process of planning and public involvement

In order to guide planned landscape changes, planners and researchers have developed local and regional landscape assessment methods. Typically these methods focus on land cover and/or land use characteristics (Wang and Moskovits, 2001; Alig et al., 2004; Palmer, 2004; Rogge et al., 2008). These techniques (e.g. satellite coverage, aerial photographs, Geographic Information Systems, land use and land cover characteristics such as shape and form, etc.) and their sophisticated measurements enable researchers and planners to define spatial and temporal changes in the landscape and produce maps that help visualise dimensions of change that might otherwise not be apparent. However, few such assessments are grounded in the experiences and concerns of residents and other stakeholders (Wagner and Gobster, 2007). More and more it is argued that public involvement is crucial to a successful planning process (Rose and Suffling, 2001; Koontz, 2003). Brandenburg and Carrol (1995) also warn for the pitfalls of oversimplifying stakeholders values in a process of public involvement and suggest that qualitative methods of social analysis can provide a richer understanding of these values. Van Eetvelde and Antrop (2004) and Rogge (2009) also point out that for a full understanding of landscape change and a sound planning process, measures from aerial photographs and census data are insufficient. They suggest to combine these data with interviews and oral history.

Research objectives

When comparing the development of greenhouse clusters to that of wind farms, there are some important distinctions to be made. The most important difference is that for more than 20 years research has shown (Thayer and Freeman, 1987; Wolsink, 1988; Walker, 1995) that there is a strong general support for wind power as it is an important source of renewable energy and it can help

fight climate change. Although greenhouse horticulture represents the value of safe and qualitative food of a local produce, it is not clear whether there is a general support for its development within the Flemish society. We therefore chose not to focus on a specific location where an actual greenhouse cluster is being developed but to probe for the acceptance of greenhouse clusters in general.

This research wants to challenge simplistic arguments (such as NIMBY) that the different actors that together constitute the agricultural sector use to explain the attitudes the public has towards the development of greenhouse clusters. Therefore this research has the objective to unravel the complex arguments of the general public vis à vis greenhouse clusters, as it is perceived by the agricultural sector.

Methods

In order to grasp the heterogeneity of the perceptions and the nuanced opinions of the stakeholders involved, and given the absence of previous research that could reveal quantitatively measurable constructs, a qualitative research design was appropriate (Carson et al., 2001). Following the grounded theory approach (Strauss and Corbin, 1998), the authors allowed the theory to emerge from the data. As such they wanted to understand the research situation, rather than to test an a priori outlined hypothesis. Because they are drawn from data, grounded theories are likely to offer insight and enhance understanding (Strauss and Corbin, 1998). This fits the above mentioned research objectives.

Data sampling

The idea behind data sampling in grounded theory is to purposefully select participants who will help the researcher understand the problem and the research question at the best (Creswell, 2003). The aim is to choose a small number of cases that will yield in-depth data for theory construction, rather than a random selection of a large number of data points to give us statistical information about the opinions of an entire population (Koontz, 2003). The selection of stakeholders was carried out according to the methods of theoretical sampling (e.g. Glaser and Strauss, 1967; Glaser, 1978; Miles and Huberman, 1994) and snowball sampling (Hunziker, 1995). The latter makes it possible to consider the whole range of thematically relevant positions in the population (Soliva, 2007) (Table 1). The former is an iterative process in which cycles of data collection and data analysis are repeated until the data collection stops yielding additional relevant insight into the research topic. In our research, over a period of 5 months, 24 respondents were interviewed in three such separate data collection phases. The open interviews lasted approximately 1.5 h.

Table 1 indicates that we have tried to interview a wide range of representatives of the agricultural sector ranging from horticulturists, to civil servants and representatives of the farmers union.

Data analysis and coding

Subsequently, the approach and method of Strauss and Corbin (1998) was followed for the analysis of the data gathered through-

Table 1
Professional background and number of respondents per category.

Agricultural policy department	8
Agricultural research	2
Spatial planning department	2
Horticulturists	5
Farmers Union	4
Environmental policy and organisations	3

out the in-depth interviews. The data of the first interview round (16 interviews, held from January 3rd till February 18th 2008) was analysed by *open coding*. As described by Strauss and Corbin (1998) the data was broken down into discrete incidents, ideas, events and acts. Each *phenomenon* that was related to the public attitude towards the development of greenhouse clusters was given a name. Whenever a certain phenomenon was mentioned by two or more respondents we defined it as a *concept*. In total 63 such concepts could be distinguished, some of them being mentioned only twice, and others mentioned by each of the 24 respondents. After the open coding of the first 16 interviews the concepts that emerged were analysed and grouped into distinct *categories*. This gave us a first explanation as to what exactly is going on. After each additional interview round (round 2, 6 interviews, March 11th–March 27th 2008; round 3, 2 interviews, May 6th–May 28th 2008) the concepts and categories were re-evaluated. Eventually we ended up with 63 concepts and 12 categories (Table 2).

In the following step of the analysis the data that was broken into concepts and categories is reassembled by *axial coding*. When coding axially we try to find out how categories link and crosscut in order to find more complete and precise explanations about phenomena. Although we do need some categories to start axial coding, it is not a separate process from open coding. In reality both techniques are closely intertwined and sometimes happen at the same time.

In the final analysis phase the categories were integrated and refined into a larger theoretical scheme by *selective coding*. Based on all data gathered in the interviews a ‘grounded theory’ was proposed. In this stage the data of the interviews was also confronted, compared and integrated with the data gathered from the analysis of press articles (next paragraph). The processes of axial and selective coding relates the twelve distinguished categories to each other. This results in a theoretical scheme that unravels and visualises the key factors that stakeholders of the agricultural sector believe to be at the basis of public resistance towards the development of greenhouse clusters.

Techniques used to ensure objectivity

During the data collection and analysis we explicitly used four triangulation techniques to ensure objectivity throughout the data gathering and analysis (Strauss and Corbin, 1998; Golafshani, 2003; Koro-Ljungberg, 2008):

- An analysis was conducted on all articles concerning the development of large-scaled greenhouses that were published by VILT (Flemish Information Centre for Agriculture and Horticulture) in the past 6 years. VILT spreads a daily e-letter of all articles concerning agriculture that are published by the major newspapers in Flanders. The data found in these articles was coded and analysed the same way as the interview data.
- Throughout the research process an attitude of scepticism must be maintained. Theoretical explanations should be validated against data in subsequent interviews or observations. After conducting about 16 interviews we did a first data-analysis round. In the subsequent interviews the preliminary results of this analysis were presented at the end of each interview. Respondents were asked whether this interpretation matched their personal experiences. In this way the data gathered in previous interviews was validated.
- The methodology and main results were presented to stakeholders on two separate occasions. On a first occasion (June 4th 2008) a group of four (three policy makers from the agricultural department and one representative from the Farmers Union) was assembled to discuss the resulting concepts, categories and

theoretical scheme. On a second occasion (June 19th 2008) 25 representatives of various organisations discussed the results of the research. Within this group there were leading horticulturists, representatives of the Farmers Union, directors of the most important fruit and vegetable auctions in Flanders and civil servants of the agricultural department. Within both these groups there was a large consensus that the distinguished 63 concepts and 12 categories correspond with how they experience the public acceptance of large-scale greenhouses on the field. Based on the discussion held on these two occasions adaptations were made at the theoretical scheme.

- The process of axial and selective coding was performed by three separate researchers who are familiar with the research situation. The theoretical scheme was built after a lot of consideration and discussion between these researchers. This approach was chosen in order to avoid any possible bias that could stem out of working with a single researcher.

Results

The main results of the research are summarised in one theoretical scheme (Fig. 2).

The concept of grouping greenhouses in a large-scaled cluster deviates quite drastically from the present situation in the greenhouse horticultural sector in Flanders today. When dealing with this subject we noticed that people easily make a distinction between a general resistance to change on the one hand and the concern for the specific risks such projects can involve on the other hand. Furthermore, our results indicate that some key factors defining the public attitude towards greenhouse clusters according to the stakeholders in the agricultural sector can be attributed to societal values. The influence of these values mainly relates to the aspects of general resistance to change but to a certain extent also accounts for some of the more specific risk perceptions people have towards the development of greenhouse clusters.

Values are stable and long-lasting (van der Pligt and De Vries, 1995). When we define them as ‘activities, behaviours, qualities, beliefs, goals-that you believe are important to do, follow or strive forward’ (McClelland, 1991), we can assume that problems that arise with the public acceptance of greenhouse clusters are to be seen against this very solid background of values. Schwartz (1994) describes a set of ten basic values that include all the core values that are recognised in cultures around the world. Some of the scepticism and arguments against greenhouse clusters can be better understood by placing them in this value structure. We found three core values that we believe relate closely to some of the issues that were mentioned by the respondents.

- The first value that can account for a lot of the resistance against the development of greenhouse clusters is *tradition*. Schwartz (1994) describes tradition as ‘respect, commitment and acceptance of the customs and ideas that traditional culture or religion provide the self’.
- The second value is *security* and is described by Schwartz (1994) as ‘safety, harmony and stability of society, of relationships and of self’.
- Finally, some of the concepts can be related to the value of *universalism*: ‘understanding, appreciation, tolerance and protection for the welfare of all people and for nature’ (Schwartz, 1994)

When describing the different elements in our theoretical scheme we will indicate which values are in play.

We first of all distinguish the categories that all have to do with a general resistance to change. The idea of grouping greenhouses in

Table 2

Overview of the 12 categories and 63 concepts that determine the public attitude towards the development of large-scale greenhouses.

Category	Concepts
Clustering	Fear for additional developments Lack of any Flemish example Is there a control of environmental burden? Financial risk? Pressure of diseases Legal certainty will be better Better environmental investments Better control and organization of traffic Better landscape integration More cooperation More efficient energy use Better cost-effectiveness Who will bear the very high costs of communal utilities such as gas, energy, water The scale of the greenhouse is perceived as a problem
Scale	Energy consumption is massive
Sustainable energy use	Cogeneration is distortion of competition Energy the 'real story' Food quality (synergy with industry) Energy commands spatial decisions
Health and environmental concerns	Pollution of water Pollution of air Sound pollution Water usage Traffic problems Light pollution Reflection of sunlight
Livelihood	Space Good land is lost for agriculture Land prices rise Conflict with other land users/owners Scarcity of land Delineation of areas Interruption of the market Fear of lagging behind Who can participate in a cluster and who can't? Several smaller family businesses or one big company? Clusters become the norm
Changing population structure	Employment of immigrants Employment of immigrants (Africans, Eastern Europeans, . . .) Locals don't want to do the job Continuous employment of unskilled labourers Perception of moonlighting and unfair wages Dutchmen Connection with the surrounding area Property developers
Place attachment	Visual pollution Landscape pollution Loss of open space
Policy level of decisions	Decision power with municipality, perceived as not good Lack of political guts Lack of vision Depended on individuals (civil servants, politicians, . . .) NIMBY Top-down decisions about the location
Time	Permit procedures are very long
Communication	Nonexistent or bad communication Inadequate information
Emotions and behaviour	Emotionally loaded Resistance against change Bitterness of the society Do Flemish horticulturists want to move? Conservative attitude Suspicion towards the unknown Jealousy
Image of horticultural sector	Negative image/fear for negative image after synergy with industry Urban legends Media gives negative and wrong coverage Some cases of malpractice

one clusters is new for the Flemish horticultural sector. This does not only has spatial consequences but also influences the traditional way of working in this sector. One of the most important traditions within the Belgian agricultural sector is 'family farming'.

More than 94% of Belgian farms are family-owned, farm succession in Belgium is from parent(s) to child(ren) and is therefore an important issue in the farm life cycle (Calus et al., 2008). The concept of large-scale greenhouses, ranging up to 20 ha and more, clustered

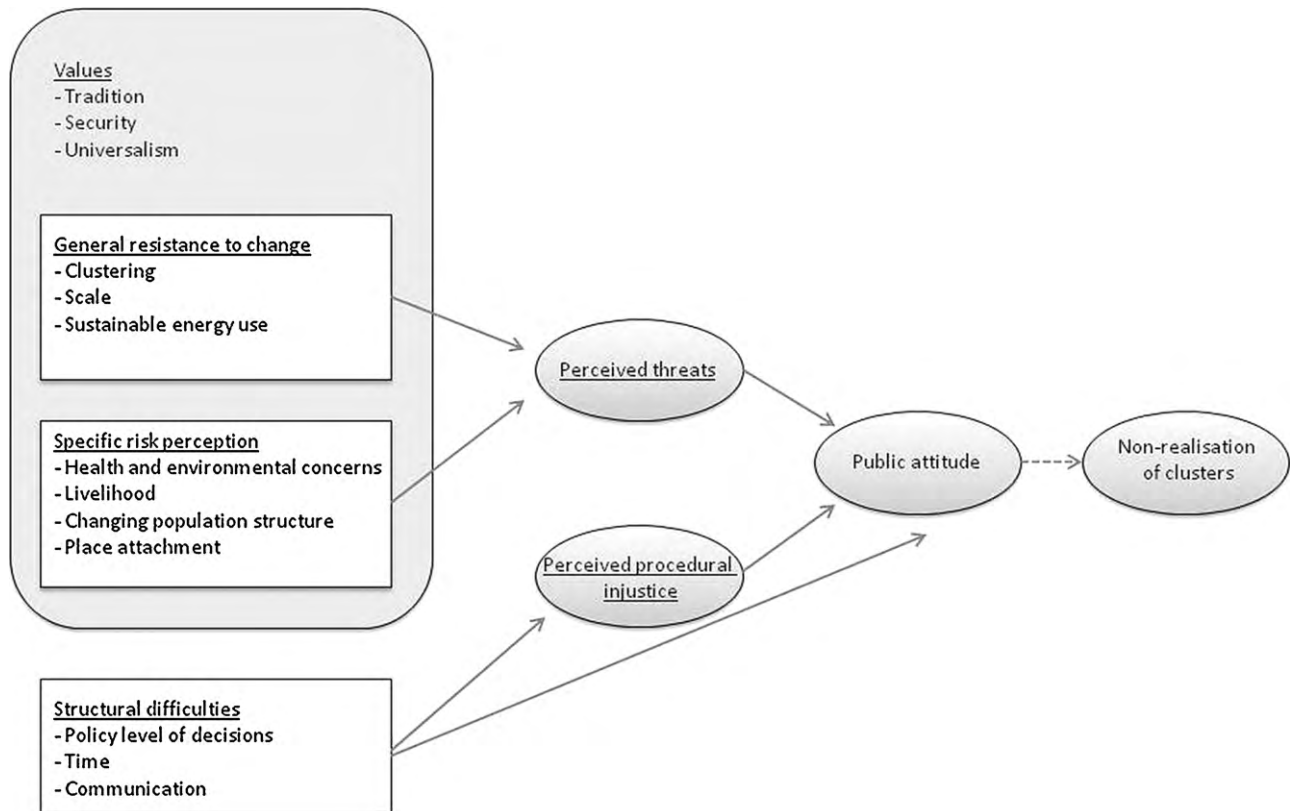


Fig. 2. Theoretical scheme explaining the relationships between all factors that representatives of the agricultural sector believe to have an influence on the public attitude towards greenhouse clusters.

in a form of cooperation deviates quite drastically from the traditional family-owned greenhouse business. Stakeholders from the agricultural sector state that the fact that the development of greenhouse clusters is initiated by property developers, is hard to accept. The involvement of property developers breaks the farm life cycle of succession from parent to child and therefore breaks with an important part of tradition.

"The question is whether we want mega sized greenhouses in such a cluster? Maybe it is better to group a few family businesses in such a park. In this way we can offer them scale advantages large companies have anyway." (agricultural policy department, province level)

"The fact that there is a property developer involved makes people presume that other developments and constructions will follow." (Farmers Union)

Another more general issue the stakeholders believe people are worried about is the question of sustainable energy use. Respondents often referred to the 'massive' energy use of greenhouses, questioning whether the public will accept irresponsible energy use by horticulturists. This concern can be linked to the value of 'universalism', where people are concerned about the protection of people and nature.

"Greenhouses may produce energy but they also use massive amounts of energy. In advertisement campaigns the government tells us to use low-energy light bulbs, but if we go out at night we see these greenhouses that give light as if they were the sun" (local politician)

Besides these general concerns people are clearly worried about the *specific risks* the development of greenhouse clusters can have

for them. First of all, there are numerous issues linked to *health and environmental concerns* people have when such a park would be constructed in their neighbourhood. Examples are air and water pollution, sound, visual and light pollution, traffic problems, etc. This clearly relates to the value of universalism as people are concerned about their welfare and nature protection (Schwartz, 1994).

"Some of these horticulturists heat with heavy fuels or with wood residues. People are concerned about the air quality. ..." (environmental organisation)

A second category relates to the fact that some people are worried that their livelihood will be affected by the development of such parks. We can distinguish two different elements. First of all there is the element of space that involves everything that has to do with the use, ownership and cost of land on the one hand and all possible tensions, conflicts and worries that result out of it on the other hand. One of the most brisk discussions surrounding the category 'space' is the impact the development of a greenhouse park will have on land prices. Especially farmers are worried about a substantial increase in land prices, making it impossible for them to purchase additional land if they want to expand their production area.

"These large clusters have nothing to do with agriculture, this is industry in which food is produced. The only reason why it has to be agriculture, is because agricultural land costs nothing. By these developments the price of agricultural land will become gigantic. Land speculation will be a certain result." (agricultural policy department, province level)

Another element related to livelihood is the effect the development of large-scale greenhouses will have on the market of the products grown in them. Smaller greenhouse owners are wor-

ried about this evolution. They fear that it will be impossible for them to compete with these clusters, especially if the production cost is lowered by the use of cogeneration. Smaller companies are also anxious for the clusters to step out of the auction circuit and contact buyers themselves, which might allow them to influence prices. They also fear that the development of clusters will become the standard against which their performance (e.g. energy efficiency, use of pesticides, use of nutrients) will be measured. These elements play an important role in the attitude a part of the greenhouse sector has towards clustering, causing disagreements and divisions within the sector itself.

“People are very scared these clusters will cause a disruption of the market. The majority of the production will then be realised by one or a few companies. These clusters will surely compromise the viability of small family-owned greenhouses” (agricultural policy department)

Another specific element of risk perception is the concern about the fact that greenhouse holdings mainly employ immigrants. A lot of rural communities are not used to the presence of foreigners and therefore have a certain anxiety about them. This fear can be related to the value of ‘security’. The stakeholders claim to notice that people are clearly worried about the fact that the *population structure* in their neighbourhood would change as a result of the development of clusters.

Talking about an area where there is a concentration of large greenhouses: “Neighbours and local people call it the Congo-street” (horticulturist)

The category of the initiator of the project can also be related to this value of security. In addition to the resistance to property developers, the sector assumes that the people are very concerned when the initiator of a project is from the Netherlands. There is some sort of fear that the immigration of Dutch people in the border regions will change the population structure and that this will cause a destabilisation of local society and of the market.

“There should be instruments to back up Flemish initiators and to keep off Dutch initiators, people don’t want Dutchmen to come over here, there would be a lot less resistance if it were Flemish developers”. (civil servants of a border municipality)

Finally the actors of the agricultural sector think that the general public is very sensitive to *place attachment*. The fact that the outlook of the place where people have been living or working for so long will drastically change causes a problem for a lot of people. Concepts such as the loss of open space, visual pollution and fragmentation of the landscape strongly relate to this sense of place attachment.

“More and more people are also concerned about the visual aspects. If you are used to having a sight on pastures and cows and suddenly there is a glass wall in front of you. . . that is a big change. . .” (environmental organisation)

The combination of a general form of resistance to change and some more specific concerns results in the fact that the stakeholders included in this research think that the general public will perceive this new development as a threat.

Besides categories related to general resistance to change and specific risk perception we can discern some categories that have to do with the *structural difficulties* people are faced with when they try to develop a greenhouse cluster. First of all there is a lot of frustration about the *policy level* at which permits are granted. Currently, municipalities are responsible for the final decision on the proposed project. A majority of the respondents feels that this is not the appropriate level to take the final decision in projects

of such a scale. They state that local politicians often have a good relationship with their residents and rely on them for electoral purposes. Therefore they are not very likely to approve projects of such scale. Furthermore, debates concerning the construction of large-scale greenhouses are often emotionally loaded and it is hard for local politicians to take an objective stance in such a discussion. Local policy is also often reproached a lack of vision and structure, because it is too dependent on the goodwill and capability of individuals (civil servants, mayors etc.).

“It is necessary that people at a higher policy level have the guts to take a decision. The local level is way too close to the people, there is too much emotion involved to make good decisions.” (agricultural union)

When the municipality rejects the application for the construction of a new greenhouse, an appeal can be lodged against this decision. This appeal has to be handled at the provincial level and eventually at the Flemish level. This is a very *time-consuming* process and horticulturists complain that their application is already out-dated and old-fashioned before it can even be realised. They also blame the government for deliberately stretching this decision procedure so that they would be discouraged and eventually give up. Decision makers are also reproached an inadequate communication with a lack of accurate information, which strengthens the negative public attitude towards greenhouse clusters.

“The project in ‘X’ is a question of political power. It was initiated by the government and no matter what: it has to be realised. . . . If you take citizens seriously you have to involve them in the planning process. Policy has to change entirely. We should evolve to a system of ‘governance’ where we try to find solutions together with citizens.” (agricultural policy department)

As appears from the quotes above, the interviewed stakeholders have the feeling that they are not properly involved in the decision process. Some respondents were even more harsh in their judgement and stated that they have the feeling that the process of granting a permit is now unfair and unjust. These three categories of policy level, bad communication and time thus lead to a perception of procedural injustice.

The combination a perceived threat and a perceived procedural injustice reflects on the public attitude of people involved. As described in the introduction there is a rising number of protest groups, public meetings, petitions, objections, etc. This negative attitude combined with a very difficult formal procedure to obtain a permit adds to the fact that until today not a single development has been realised in Flanders.

Discussion

The theoretical scheme gives us insight in the reasons and underlying motives that the stakeholders of the agricultural sector believe to be at the basis of public resistance against the development of greenhouse clusters. Based on this scheme we can immediately see that there is no monocausal relationship between one specific factor and the public attitude. First of all some of our societal values provide a basis for scepticism against these large constructions. This corresponds with the findings of Gross (2007) who states that conflicting perspectives on values are frequently at the basis of divisions in local communities when dealing with problems of land use and natural resource management.

Besides the influence of values we distinguished several general or specific concerns which make people perceive the development of greenhouse clusters as a threat. Some of the elements that

were mentioned by the respondents correspond with findings in literature relating to protest against certain unwanted land uses. Mannarini et al. (2009) for example also stress the importance of environmental and health concerns where people are worried about territorial ravage, water and atmospheric pollution. In our research comparable concerns were abundantly mentioned by the respondents. There is an apparent fear for water, air, light and sound pollution caused by these large greenhouses.

Another important element that emerged was the concern people have about their livelihood. People are afraid that these large greenhouses will disrupt the market and will influence prices of products on the one hand and prices of land on the other hand, making it hard for them to economically survive. Gross (2007) also recognised the concern for one's livelihood as an important driving factor in protest actions. Often the preservation of jobs is placed against the preservation of some kind of natural recourse (for example the preservation of forest).

The element of place attachment is also not unique to the case of greenhouse clusters in Flanders. Lewicka (2005), Stedman (2002) and Mannarini et al. (2009) all point out that place attachment largely determines people's willingness to participate in local protest actions.

The combination of a general resistance to change with some specific risk perceptions contributes to the increase of perceived threat of greenhouse clusters. As van den Berg and Vlek (1998) state this perceived threat causes an intensification of the public resistance.

In addition to this perceived threat there are also some structural difficulties within the planning process that hamper the realisation of greenhouse clusters. These problems are however quite pertinent as they lead to a perception of injustice. Several authors have focused on the concepts of fairness and justice when trying to explain local protest actions against all sorts of developments. Mannarini et al. (2009) describe this as a democracy concern where people have the feeling that they are not involved in the decision process at all. Gross (2007) elaborates on the concept of procedural injustice and refers to elements such as the right of participation, and lack of bias on the part of the decision maker. Wolsink (2007) also studied this phenomenon and states that the commitment to fairness becomes clearly manifest. The crucial factor is not that residents have a strong intention to shift burdens to others, but that they consider it unfair that others, or the decision maker, shift the burden to them. This suggests that the crucial factor in protest are not issues of egotism, but fair decision making that does not cause any perceived injustice.

The theoretical scheme shows that these structural difficulties are not isolated. There is definitely an interaction between the perceived public attitude and these more practical problems. For example: one of the main reasons planning procedures take so much time is because there is always some sort of public objection against the proposed plans. On the other hand, inadequate communication and time-consuming planning procedures add to the general negative attitude held by the public towards these developments.

The theoretical scheme gives us an idea of the complexity of the problem. Clearly, there is more to the resistance than the fear for nuisance alone. Oversimplifying the problem by stating that the reasons for protest solely stem out of the NIMBY effect (as project developers, policy makers and some actors of the agricultural sector often do) can be countered by the results of this research. This largely corresponds with the results of Warren and McFayden (2010), Wolsink (2006, 2007), van der Horst (2007) and Krohn and Damborg (1999) who all state that the NIMBY idea is too simplistic a concept to explain the multi-faceted reasons for oppositional behaviour.

Conclusion

As suggested by several authors (Brandenburg and Carrol, 1995; Van Eetvelde and Antrop, 2004; Wagner and Gobster, 2007) this research confirms the fact that a qualitative research approach can contribute valuable information to the process of a planned landscape change. The resulting theoretical scheme not only gives a better insight in the way the agricultural sector perceives the factors that determine the public attitude towards greenhouse clusters, but it also enhances the understanding of the complexity of the situation. This knowledge and insight provides policy makers with detailed information on the stance different stakeholders have towards the development, enabling them to anticipate certain problems. It is therefore our belief that the use of a grounded theory approach could have an important added value in a spatial planning context.

This research has focused on the perceptions of the actors of the agricultural sector. It is clear that these perceptions are not objective, as they are coloured by their own interests, in the same way as the perceptions of other actors will be influenced by their own interests. This urges to investigate the perceptions of other stakeholder groups in future research, as it may enrich and strengthen the policy implications of the actual research.

References

- Agüera, F., Liu, J.G., 2009. Automatic greenhouse delineation from QuickBird and Ikonos satellite images. *Computer and Electronics in Agriculture* 66, 191–200.
- Alig, R.J., Kline, J.D., Lichtenstein, M., 2004. Urbanization in the US landscape: looking ahead in the 21st century. *Landscape and Urban Planning* 69 (2–3), 219–234.
- Brandenburg, A., Carrol, M., 1995. Your place or mine? The effect of place creation on environmental values and landscape meanings. *Society and Natural Resources* 8 (5), 381–398.
- Calus, M., Van Huylenbroeck, G., Van Lierde, D., 2008. The relationship between farm succession and farm assets on Belgian Farms. *Sociologia Ruralis* 48 (1), 38–56.
- Carson, D., Gilmore, A., Perry, C., Gronhaug, K., 2001. *Qualitative Marketing Research*. Sage Publications, London.
- CBS, 2010. Centraal Bureau voor de statistiek, Den Haag. Last accessed June 18th 2010 <http://www.cbs.nl>.
- Macquarie, C.C.H., 1996. *The CCH Macquarie Dictionary of Law*. CCH Australia Limited, Sydney.
- Creswell, J.W., 2003. *Research Design: Qualitative, Quantitative and Mixed method Approaches*. Sage Publications, Thousand Oaks, CA.
- Glaser, B., 1978. *Theoretical Sensitivity*. Sociology Press, Mill Valley, CA.
- Glaser, B., Strauss, A., 1967. *Discovery of Grounded Theory*. Aldine, Chicago.
- Golafshani, N., 2003. Understanding reliability and validity in qualitative research. *The Qualitative Report* 8, 597–607.
- Gross, C., 2007. Community perspectives of wind energy in Australia: the application of justice and community fairness framework to increase social acceptance. *Energy Policy* 35, 2727–2736.
- Hunziker, M., 1995. The spontaneous reforestation in abandoned agricultural lands: perception and aesthetic assessment by locals and tourists. *Landscape and Urban Planning* 31, 399–410.
- Kahneman, D., Tversky, A., 1979. Prospect theory: an analysis of decision making under risk. *Econometrica* 47, 363–391.
- Koontz, T.M., 2003. The farmer, the planner and the local citizen in the dell: how collaborative groups plan for farmland preservation. *Landscape and Urban Planning* 66, 19–34.
- Koro-Ljungberg, M., 2008. Validity and validation in the making in the context of qualitative research. *Qualitative Health Research* 18, 983–989.
- Kristensen, S.P., 1999. Agricultural land use and landscape change in Rostrup. Denmark: process of intensification and extensification. *Landscape and Urban Planning* 46, 117–123.
- Krohn, S., Damborg, S., 1999. On public attitudes towards wind power. *Renewable Energy* 16 (1–4), 954–960.
- Leterme, Y., 2007. Beleidsbrief 2007: Landbouw, Zeevisserij en Plattelandsbeleid. Last accessed: June 17th 2010 <http://docs.vlaanderen.be/portaal/beleidsbrieven2006/leterm/beleidsbrief.landbouw.pdf>.
- Lewicka, M., 2005. Ways to make the public active: the role of place attachment, cultural capital and neighbourhood ties. *Journal of Environmental Psychology* 25 (4), 381–396.
- Mannarini, T., Roccato, M., Fedi, A., Rovere, A., 2009. Six factors fostering protest: predicting participation in locally unwanted land uses movements. *Political Psychology* 30 (6), 895–920.
- McClelland, D., 1991. *The Personal Value Questionnaire*. McBer&Company, Boston.
- Miles, M., Huberman, A., 1994. *Qualitative Data Analysis*. Sage Publications, Thousand Oaks, CA.

- Ministerie van de Vlaamse Gemeenschap Administratie Land- en Tuinbouw, 2003. Actieplan: Naar een duurzamere glastuinbouw in Vlaanderen.
- NIS, 2005. Ministerie van Economische Zaken, Brussel. Last accessed: June 17th 2010 <http://www.statbel.fgov.be>.
- Palmer, J., 2004. Using spatial metrics to predict scenic perception in a changing landscape: Dennis Massachusetts. *Landscape and Urban Planning* 69 (1–2), 201–218.
- Rogge, E., Nevens, F., Gulinck, H., 2008. Reducing the visual impact of 'greenhouse parks' in rural landscapes. *Landscape and Urban Planning* 87 (1), 76–83.
- Rogge, E., 2009. About landscape perception and the ability to communicate. Can landscape perception research provide a tool for starting a dialogue between different users of the countryside? Ph.D. Thesis, K.U. Leuven, Leuven, Belgium.
- Rose, M., Suffling, R., 2001. Alternative dispute resolution and the protection of natural areas in Ontario, Canada. *Landscape and Urban Planning* 56, 1–9.
- Schwartz, S.H., 1994. Are there universal aspects in the content and structure of values? *Journal of Social Issues* 50, 19–45.
- Sell, J.L., Zube, E.H., 1986. Perception and response to environmental change. *Journal of Architectural and Planning Research* 3, 33–54.
- Soliva, R., 2007. Landscape stories: using ideal type narratives as a heuristic device in rural studies. *Journal of Rural Studies* 23, 62–74.
- Staats, H., Van de Wardt, J.W., 1990. Changing a small-scale landscape: environmental psychology applied to problems of the countryside. *The Netherlands Journal of Housing and Environmental Research* 5, 65–86.
- Statcan, 2010. Statistics Canada, Ottawa. Last accessed: June 18th 2010 <http://www.statcan.gc.ca>.
- Stedman, R.C., 2002. Towards a social psychology of place: predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior* 34, 561–581.
- Strauss, A., Corbin, J., 1998. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Sage Publications, Thousand Oaks, CA.
- Strumse, E., 1996. Demographic differences in the visual preference for agrarian landscapes in Western Norway. *Journal of Environmental Psychology* 16, 1–15.
- Thayer, R.L., Freeman, C.M., 1987. Altamont: public perception of a wind energy landscape. *Landscape and Urban Planning* 14, 379–398.
- van den Berg, A.E., Vlek, C.A.J., 1998. The influence of planned-change context on the evaluation of natural landscapes. *Landscape and Urban Planning* 43, 1–10.
- van der Horst, D., 2007. NIMBY or not? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies. *Energy Policy* 35, 2705–2714.
- van der Horst, D., Toke, D., 2010. Exploring the landscape of wind farm developments; local area characteristics and planning process outcomes in rural England. *Land Use Policy* 27, 214–221.
- van der Pligt, J., De Vries, N., 1995. *Opinies en attitudes: metingen, modellen en theorie*. Boom, Amsterdam.
- Van Eetvelde, V., Antrop, M., 2004. Analyzing structural and functional changes of traditional landscapes: two examples of Southern France. *Landscape and Urban Planning* 67 (1–4), 79–95.
- Walker, G., 1995. Renewable energy and the public. *Land Use Policy* 12, 49–59.
- Wang, Y., Moskovits, D.K., 2001. Tracking fragmentation of natural communities and changes in land cover: applications of Landsat data for conservation in an urban landscape (Chicago wilderness). *Conservation Biology* 15 (4), 835–843.
- Wagner, M.M., Gobster, P.H., 2007. Interpreting landscape change: measured biophysical change and surrounding social context. *Landscape and Urban Planning* 81, 67–80.
- Warren, C.R., McFayden, M., 2010. Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland. *Land Use Policy* 27, 204–213.
- Willis, K.G., Garrod, G.D., 1992. Assessing the value of future landscapes. *Landscape and Urban Planning* 23, 17–32.
- Wolsink, M., 1988. The social impact of a large wind turbine. *Environmental Impact Assessment Review* 8 (4), 323–334.
- Wolsink, M., 2006. River basin approach and integrated water management: governance pitfalls for the Dutch space-water-adjustment management principle. *Geoforum* 37 (4), 473–487.
- Wolsink, M., 2007. Wind power implementation: the nature of public attitudes: equity and fairness instead of 'backyard motives'. *Renewable and Sustainable Energy Reviews* 11 (6), 1188–1207.
- Woods, M., 2003. Conflicting environmental visions of the rural: windfarm development in Mid Wales. *Sociologia Ruralis* 43 (3), 271–288.